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Marginal Effective Tax Rates in Thailand

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Abstract

The paper estimates the overall marginal effective tax rate for savers in Thailand and marginal effective tax rates classified by source of funds, category of owners and type of firms in Thailand. The marginal effective tax rate for domestic savers that include local investors and tax-exempt institutions are analyzed in the case of Thailand. As a byproduct, the marginal host country effective tax rates of foreign investors are also obtained in the case of Thailand that has no double tax treaties with other countries. The overall marginal effective tax rate for domestic savers is approximately 38.4 percent. In addition, the marginal effective tax rate for domestic savers in companies listed in the Security Stock of Exchange is 22.2 percent and that in unlisted firms is approximately 39.8 percent. The differential is due to a heavier use of owner equity whose savers in the non-SET firms have to bear capital gains tax and a less reliance of debt finance whose ultimate owners of non-SET firms bear a larger effective tax. For foreign investors, the overall marginal effective tax rate paid to Thailand is about 31.6 percent, much higher than tax rates of domestic saversb as foreigners do not benefit from dividend tax credit.

Keywords: Marginal Effective Tax Rate, User Cost of Capital and Income Tax

Introduction

After the seminal work by Jorgerson (1963), there are voluminous studies on the user costs of capital and the marginal effective tax rates (METRs) both in developed and developing countries. Leechor and Mintz (1991) and Boadway, Flatters and Wen (1992) and Aemkulwat (1998) have studied METRs in the case of Thailand. Leechor and Mintz (1991) found that the marginal effective tax rate for SET firms was 31 percent and that for non-SET firm was 40.7 percent in 1989. Boadway, et al. (1992) found that the marginal effective tax rates for large firms were larger than those for small firms since large firms relied more heavily in debt than small firms. Aemkulwat (1998) studies the effects on the investment incentives facing a multinational whose home country is the United States when Thailand were to adopt a consumption-based tax. Although these studies answer questions of specific interest, none provide the overall marginal effective tax rate of domestic savers in Thailand obtained from source of funds, category of owner and type of firm.

The objective of the paper is to find the overall marginal effective tax rate and METRs classified by souce of funds, category of owner and type of firm. The overall marginal effective tax rate for domestic savers is found to be 38.4 percent. In order to obtain the overall METR on savings, the total company financing of the nonfinancial corporate sector that varies by source of finance, type of firm, and category of owners is constructed. The nonfinancial corporation sector is the corporate sector that excludes financial institutions. In 2007, total financing amounted to 63.7 trillion baht, of which 23 percent was from foreign source and 77 percent was from domestic source. The marginal effective tax rates (METRs) are analyzed for two types of firms: firms listed in the Security Exchange of Thailand (SET) and firms not listed in the Security of Exchange of Thailand (non-SET). Companies raise funds from three sources: debt issues, retained earnings and new share issues. There are three types of owners: local investors, tax-exempt institutions and foreign investors. The existing ownership patterns are assumed to reflect savings required to finance the investment.

The paper takes the view that households are the ultimate owners of a company as stockholders and of debts financing to a company. Households provide the flow of private savings into real business investment directly through equity investment or corporate debentures purchase or indirectly through intermediaries such as commercial banks and finance companies. In turn, companies receive the flow of profits that are used to pay interest to corporate debentures or bank borrowing and provide returns to households in the form of dividends and share value appreciation. Given that corporate profits are taxed at the corporate level and capital income such as interest, dividend and capital gains is taxed at the personal level, households or savers

are the ones who bear the ultimate burden of the corporation and personal income taxes.

The marginal effective tax rate measures the incentive to save and invest in the nonfinancial corporate sector due to the impact of the corporation and personal income taxes. It is the difference between the gross-of-tax return on investment and the net-of-tax return on savings; the proportion divided by the gross-of-tax return on investment. The return on investment can be derived by finding the user cost of capital that takes into account the corporation income tax. The return on savings net of the personal income tax takes into account different types of capital income such as interest, dividends and capital gains.

The paper is divided into 5 sections. A description of the corporation and personal income tax system is discussed in Section 1. The model for finding the marginal effective tax rate is derived in Section 2. The structure of ownership and source of finance is analyzed in Section 3. The estimates of the marginal effective tax rate are given in Section 4. Conclusions are in Section 5.

1. The Income Tax System

The Revenue Code outlines rules and regulations for the imposition of corporation and personal income tax. A brief description of the personal and corporation income tax system is given below.[1]

1.1 Corporation Income Tax System

Income earned from sources in and outside of Thailand is subject to corporate taxation for all companies incorporated under the law of Thailand. Foreign companies are subject to tax only income derived from carrying on business in Thailand. Net loses can be carried forward for up to five consecutive years. The tax rates, deductions, and withholding taxes are described, in turn, for the corporation income tax system in Thailand.

Tax Rates

The corporate income tax is charged on worldwide profits on the accrual basis at the standard rate of 30 percent. However, lower tax rates are provided under three incentive programs. The tax rates vary depending on types of taxpayers. First, temporary tax holidays or substantial tax reductions are granted to firms promoted

[1] See www.rd.go.th for a full description of the income tax in Thailand.

by the Board of Investment. In addition, venture capitalists[2] are exempt from the corporation income tax. Second, firms listed in the Securities Exchange of Thailand (SET) and Market for Alternative Investment (MAI) are entitled to lower tax rates for the first five accounting periods beginning September 6, 2001. A lower tax rate of 25 percent is given to the first 300-million-baht profits of SET firms listed before 2001 and all newly listed firms. Moreover, a lower tax rate of 20 percent is available to newly listed firms in MAI.[3] Third, the small company[4] is subjected to the corporation income tax rate at a graduated scale. Profits less one million baht are subject to 15 percent tax rate; profits from one to three million baht, 25 percent tax rate; and profits exceeding three million baht, 30 percent tax rate.

Deductions

Normal business expenses and depreciation allowances are allowed as deductions from gross income. Interest costs are fully deductible. Thailand has no rules for curbing thin capitalization. The absence of such rules provides an incentive for companies to be highly leveraged in order to reduce taxes. Inventories are valued at cost or at market price, whichever is lower.

Depreciation deduction is allowed as a percentage of historical cost with no inflation adjustment. The straight line is commonly used by companies, although any other acceptable depreciation method is also allowed. The rates of annual depreciation vary from 3 to 20 years: 3 years for computers and accessories, 5 years for equipment and machinery, and 20 years for plants and building. After the economic crisis of 1997, several government measures allow accelerated depreciation. First, the fiscal stimulus package of 1999 allows double declining balance method in the computation of depreciation deductions for equipment and machinery. Second, in 2001, small and medium enterprises[5] on the date of acquisition are allowed initial allowance of 60 percent for computers and accessories, 40 percent for machinery and equipment, and 25 percent for plant and building; the remaining value or the residual of these assets can be depreciated according to the straight line method. In addition, cash registering machines are allowed immediate expensing.

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[2] Venture capitalists are firms that provide funds for SMEs and are major shareholders whose ownership exceeds 80 percent.

[3] The reduced rate applies for currently listed and new listed companies in SET and MAI registered within 6 September 2001 to 5 September 2005.

[4] Small company refers to companies with paid-up capital less than 5 million baht at the end of each accounting period.

[5] Small and medium enterprises refer to firms with reproducible asset not exceeding 200 million baht and employees not exceeding 200 persons.

Some expenses are allowed at a special rate. Research and development expenses as well as expenditure on provision of equipment for the disabled are allowed 200 percent deduction. Job training expenses are allowed 150 percent deduction.

Withholding Tax

Corporations are required to withhold taxes on income from interest, dividends and certain capital gains. The withholding tax rates depend on the types of income and tax status of the recipient. For non-residents, withholding taxes depend on the provision of double tax treaties. Generally, for domestic individuals and nonresident corporations and individuals, the withholding tax rate on interest income is 15 percent. Moreover, the withholding tax rate on dividends is 10 percent for residents and nonresidents. For firms not listed in the Security Exchange of Thailand, the withholding tax rate on capital gains from non-SET equity shares is 10 percent. Capital gains from the sale of shares listed in SET are exempt from tax.

1.2 Personal Income Tax System

Personal income tax is imposed on assessable income, of residents and nonresidents, derived from employment, business, capital gains and investment income. Assessable income covers both in cash and in kind. For example, benefits from rent-free housing given by employer must be included as the assessable income of the employees. The personal income tax is charged on taxable income, derived from assessable income less deductions and allowances. Net annual income is taxed at a graduated scale. Personal tax rates range from 10 to 37 percent as shown below.

Table 1 Income Tax Brackets and Personal Tax Rates in 2007

Taxable Income	**Tax Rate (%)**
0 – 100,000 (2004 onwards)	**Exempt**
100,001 - 500,000	10
500,001 - 1,000,000	20
1,000,001 - 4,000,000	30
4,000,001 and over	37

Source: Revenue Department

Assessable income is divided into 8 categories including income from personal services, employment positions, goodwill and copyrights, property, liberal profession, construction and other contracts, and the capital income. The capital income includes interest, dividends, and capital gains. A tax withheld from capital income at source will be credited against the tax liability of the tax payer in the computation of the personal income tax.

Interest

Interest on bank deposits and debt securities are subject to tax withholding at a flat rate of 15 percent. Individuals may choose to exclude interest income from taxable income, in which case a withholding tax of 15 percent is paid. Another option is to include interest income in the computation of personal income tax.

Dividends

A dividend tax credit from companies is given to taxpayer who domiciles in Thailand, given a view that personal and corporate income tax should be integrated. It is equal to the dividend multiplied by the ratio of the corporate tax rate to one minus the corporate tax rate. The assessable income is the dividend grossed up by the amount of the tax credit received. Gross dividends are included with other income and subject to the progressive personal income tax rate. Dividends paid by companies are subject to tax withholding at a flat rate of 10 percent. In addition, shares of profits from a mutual fund are subject to a withholding tax of 10 percent, but tax credit is not allowed. Like interest income, taxpayer has a choice whether to include dividends or shares of profits in the calculation of the personal income tax or exclude them from taxable income. In the latter choice, taxpayer could not claim tax credit on dividends. Foreign taxpayers are required to include dividends in the computation of the personal income tax. No tax credit is given to dividends.

Capital gains

Most types of capital gains are taxed as ordinary income. However, tax exempt is given to capital gains from the sale of shares listed in the Security of Exchange and from the sale of investment units of mutual funds. Capital gains from the sale of shares of firms not listed in the Security of Exchange are taxed as ordinary income.

2. The Model of the Marginal Effective Tax Rate

The marginal effective tax rate (METR) on investment and savings is determined by the interactions of the corporate and personal income taxation that vary by type of firms, source of finance, and category of owners. It measures the extent to which various income taxes affect the marginal rate of tax. The METR on investment and savings is the difference between the rate of return on investment, r_g, and the rate of return on savings, r_n, divided by the rate of return on investment. It can be written as

$$\text{METR} = \frac{r_g, -r_n}{r_g} \tag{1}$$

The value of METR measures the size of the effect of corporate and personal taxes on the rate of return. The effect of corporation tax system on marginal rate of return is incorporated in r_g, which is the user cost of capital c less the depreciation rate δ so that different types of assets (eg. building and equipments) can be compared:

$$r_g = c - \delta \tag{2}$$

The derivation of the user cost of capital is in the next subsection. The effect of the personal income tax system is incorporated in the rate of return on saving r_n, which is the market rate of return, r, less the applicable personal income tax that varies by category of owner, type of firm, and source of finance. The market rate of return is assumed to be determined by an arbitrage in which all projects offer the same rate of return to savers before personal tax.

2.1 User Cost of Capital

The user cost of capital[6] is derived for a one unit (baht) of investment of a hypothetical project that corresponds to a combination of firms, owners, and sources of fund. The investment generates a stream of profits, c; at a moment in time, the profit or the value of marginal product of capital, net of tax, is reduced overtime due to the depreciation rate, δ, and the discount rate, r, and increased overtime due to the inflation rate, π. Given the corporation tax rate, u, the present discounted value of the net profits of the project, V, can be written as

[6] See similar derivation in Bradford and Fullerton (1981) and King and Fullerton (1984).

$$V = \int_0^{\infty} (1-u)c\, e^{-(r-\pi+\delta)t}\, dt = \frac{(1-u)c}{r-\pi+\delta} \tag{3}$$

The cost of the project[7] C is one baht of investment less the present value of tax allowances of depreciation, A:

$$C = 1-A \tag{4}$$

Assume that firm assets are depreciated at an exponential rate and the government also allows depreciation deduction equals to economic depreciation. The present value of tax depreciation of one unit of capital can be written as

$$A = \int_0^{\infty} e^{-(r-\pi+\delta)t}\, dt = \frac{u\delta}{r-\pi+\delta} \tag{5}$$

For any given discount rate, the value of marginal product of capital that equates the net present value V and the cost of the project c is the return the project must earn if the firm is maximizing profit. Thus, the value of marginal product of capital or the user cost of capital is

$$c = \frac{(r-\pi+\delta)(1-A)}{(1-u)} \tag{6}$$

The user cost of capital is equal to the gross-of-depreciation real rate of return $(r-\pi+\delta)$ grossed up by the corporation income tax $(r-\pi+\delta)/(1-u)$ less tax benefits from depreciation deductions, $A(r-\pi+\delta)/(1-u)$.

Firms can finance their projects through either borrowing or equity financing. Assume there is no inflation ($\pi = 0$). Let i be the interest rate in the market and ρ be the cost of equity finance. In the polar case of equity finance where the discount rate of the firm is ρ, the user cost of capital can be written as

$$c = \frac{\rho}{1-u} - \delta \tag{7}$$

[7] The model ignores inventories and land in the analysis.

In another polar case of debt finance, since firms are allowed for interest deductions for the cost of borrowing, the discount rate of the firm is i(1-u). Substitute i(1-u) for r in equation (6), the user cost of capital is

$$c = i - \delta \tag{8}$$

Suppose money and capital markets are in equilibrium; that is, individuals can earn the same rate of return before tax whether they invest in debt securities or in equity shares, $\rho = i$. Comparing equations (7) and (8), the user cost of capital under the equity finance is much larger than that under full debt finance. Under the equity finance, the nominal return on equity in the user cost of capital is grossed up by the corporate tax; this obviously makes sense since the user cost of the firm must be just high enough to cover the corporation tax in equilibrium. An interesting result is under the case of full debt finance where interest deductibility is allowed. The user cost of capital is shown to be independent of the corporation income tax. Unlike the equity finance, the cost of borrowing is not grossed up by the corporation income tax. We obtain this result because the government allows depreciation deductions that reflect true economic depreciation and interest expenses to be fully deductible. In contrast, the cost of equity is not tax deductible; this leads to a higher user cost under the equity finance.

The rate of return on investment is the gross-corporate-tax return on marginal investment. It is the difference between user cost of capital and the depreciation rate, $r_g = c - \delta$. Thus, under full debt finance, $r_g = i$; under equity finance, $r_g = \rho/(1-u)$. Similar to the above arguments, the gross return on investment under equity finance is the real cost of equity grossed up by the corporation income tax, whereas the gross return under full debt finance is simply the real market interest rate.

2.2 Net of Tax Real Return on Savings

The rate of return on savings is the net-of-personal-tax return to savings, r_n. Savers earn various capital incomes that include interest income from corporate debentures and deposits in financial institutions and dividend income and capital gains from owning equity in a company. We assume that arbitrage results in an outcome that savers earn the same return before personal tax from money and capital markets. The net-of-tax rate of returns on savings by category of owners and type of firms are derived for interest income, dividend income and share value appreciation. Since households are the ultimate owner of investment units issued by mutual funds,

the net-of-tax returns on savings of tax-exempt institutions are found at the personal level.

In estimating the marginal effective tax rates in Section 4, we use only the top marginal personal income tax rate of 37 percent. The net returns by source of income will also be given for top-bracket investors.

Interest Income

The returns net of personal tax on deposits and corporate debentures for local investors, institutions and foreign investors are discussed. The tax treatment on interest income below is the same for SET and non-SET firms.

Local investors Taxpayers have a selection to include interest income in the computation of personal income tax or to exclude income from calculation provided that a tax of 15 percent is withheld at source. The net-of-personal-tax return can be written as $r_n = i\ (1 - m_i)$, where i is the interest rate on debt securities or bank deposits and m_i is the marginal income tax rate of individual i. Since we assume that local investors are at the top personal income tax rate of 37 percent, local investors would choose to pay only the withholding rate of 15 percent or $w^I = 0.15$. Thus,

$$r_n = i(1- w^I), \tag{9}$$

where w^I is the withholding tax rate on interest income.

Institutions At the institutional level, interest income is free from tax. Since shares of profits from investment units to local investors are subject to withholding tax at source of 10 percent. Taxpayers also have an option whether to include shares of profits in the computation of the personal income tax or exclude by simply paying the withholding tax. If they choose the former option, $r_n = i\ (1-m_i)$. If they choose to pay just the withholding tax,

$$r_n = i(1-w^U), \tag{10}$$

where w^U is the withholding tax rate on shares of profits ($w^U = 0.1$).

Foreign Investors A tax of 15 percent on interest income is withheld for nonresidents, although it is subject to provisions in double tax treaties. We assume that nonresidents bear the withholding tax of 15 percent. Thus, the net return on foreign savers is

$$r_n = i(1- w^{FI}), \tag{11}$$

where w^{FI} is the withholding tax rate on interest income of nonresidents and $w^{FI} = 0.15$.

Dividend Income

The net-of-tax returns on dividend income by category of investors are discussed in the same sequence. The tax treatment on dividend income by category is the same for SET and non-SET firms.

Local investors Provided that corporation and personal income taxes are integrated, taxpayers are entitled to tax credit of dividend income from companies incorporated in Thailand. The assessable income for dividends is found by grossing up dividends by the amount of the tax credit received and taxed at the graduated tax rate, m_i The assessable income of one baht of dividend is 1/(1-u). The amount of tax credit of each baht of dividend is u/(1-u), where u is the corporation income tax rate. Thus, the effective dividend tax rate m^D is the difference between the marginal tax rate and the tax credit rate on the assessable income of one baht of dividend, or $m^D = (m_i-u)/(1-u)$. Provided that the firms pay a constant corporate tax rate of 30 percent, the effective dividend tax rate for top-bracket investor is 10 percent. Given ρ as the real return on equity, the net-of-tax rate of return on dividends is

$$r_n = \rho(1-m^D) \tag{12}$$

As interest income, taxpayers have an option whether to include dividends as part of taxable income or to exclude from taxable income by simply paying withholding tax rate of 10 percent at source. Let w^D be the withholding tax rate; the net return of the latter choice is $r_n = \rho(1-w^D)$. As $m^D = w^D$, Top-bracket taxpayer will be indifferent in either option.

Institutions At the institution level, dividend income is exempt from taxation and a tax credit is not given. At the personal level, shares of profits from general funds are withheld 10 percent tax at source. Individuals have a choice either to include shares of profits with other taxable income in computation of the personal income tax or to exclude it from income. The net-of-tax rate of return to investors is either $r_n = \rho(1-m_i)$ where m_i is the marginal personal tax rate or choosing to pay the withholding tax:

$$r_n = \rho(1-w^U). \tag{13}$$

Wealthy savers would choose the option of paying the withholding tax at source.

Foreign Investors Dividend income from Thai companies is fully taxable at the graduated personal tax rate with no tax credit given. Companies are required to withhold 10 percent tax. Nevertheless, nonresidents have no option like residents and must include dividends in computation of the personal income tax.[8] Thus, the net-of-tax rate of return to foreign investors is

$$r_n = \rho(1-m_i) \tag{14}$$

where m_i is the marginal personal tax rate.

In addition, shares of profits from general funds or unit trusts are withheld 10 percent tax at source. Foreign investors have a choice to include or exclude this type of income from the taxable income. Thus, the net-of-tax return on annual return from general funds to foreign investors is $r_n = \rho(1-w^U)$ where $w^U = 0.1$.

Capital Gains

The net of tax returns of capital gains to stockholders are discussed for local investors, tax-exempt institutions, and foreign investors.

Local investors Tax imposed is different on capital gains derived from SET and non-SET firms. Capital gains from the sale of shares of firms listed in SET are exempt from income tax. In contrast, capital gains from non-SET firms are taxed as ordinary income. Capital gains are withheld at source at the tax rate of 15 percent.

Let m_g be the effective accrued capital gains tax rate. The net-of-tax rate of return on capital gains is

$$r_n = \rho(1-m_g) \tag{15}$$

For SET firms, m_g is equal to zero; thus, $r_n = \rho$.

The effective accrued tax rate for non-SET firms is positive but less than the marginal income tax rate of the taxpayer. Capital gains are taxed on realization. We follow King and Fullerton (1984) to find the effective accrued tax rate by assuming that holding period is ten years or $\alpha = 0.1$ Assume the accumulated capital gains are equal to one baht. At a given point in time, the proportion α of capital gains are

[8] TDRI (2001) reports that in practice nonresidents do not include dividend income in the computation of the personal income tax in Thailand.

realized by investors. Provided that r is the discount rate of the investor and α is given, the present discounted value of the stream of capital gains is $\int_0^\infty \alpha e^{-\alpha t} e^{-(r-\pi)t} dt$, which is equal to $\alpha/(\alpha+r-\pi)$. When multiplying the present value of all capital gains by the marginal tax rate of the investor, we obtain the effective accrued tax rate, which is $m_i\alpha/(\alpha+ r-\pi)$. Given $\pi = 0$, $\alpha = 0.1$, and $r = 0.1$, the effective capital gains tax rate for top-bracket investor is 18.5 percent.

Institutions Income from the sale of company shares at the institution level is tax exempt. At the personal level, capital gains in the sale of investment units of general funds are exempt from taxation for both residents and nonresidents. Thus,

$$r_n = \rho \tag{16}$$

Foreign Investors Capital gains in the sale of SET shares are exempt from taxation, but profits from the sale of non-SET shares are withheld tax at source at the rate of 15 percent. Let w^{GF}=.10. The capital gains tax m_g^F from non-SET firms is $w^{GF}\alpha/(\alpha+r-\pi)$ or 5 percent (m_g^F= $w^{GF}\alpha/(\alpha+r-\pi)$=5 percent). Thus, r_n=ρ for SET firms and

$$r_n = \rho(1-m_g^F) \tag{17}$$

for non-SET firms

3. The Structure of Ownership and Source of Finance

This section attempts to construct the structure of ownership of debt and equity for the nonfinancial corporate sector. The nonfinancial corporate sector is the corporate sector excludes financial institutions such as banks, finance and insurance companies. The nonfinancial business sector comprises SET and non-SET firms. The owners are classified as local investors, local institutional investors (institutions) and foreign investors.

Financing by source of funds, category of owners and type of firms can be found as follows. First, we construct the total debt finance by type of firm and then the total equity finance by type of firm. Next, we find the proportions of different owners by source of fund for SET and non-SET firms. Finally, we construct domestic and foreign source of funds in 2007 varying by category of owners, firms and source of finance.

3.1 Debt Finance

Debt finance by type of firm is obtained from foreign and domestic borrowing. First, we find debt finance accrued from domestic and foreign sources and then find the debt finance of SET and non-SET firms.

The ownership of debt takes into account how the nonfinancial business sector may obtain domestic and foreign debt finance. The nonfinancial foreign borrowing includes both long-term and short-term existing external debt of non-bank private institutions at the end of each period.[9] Total domestic debt includes debt securities[10] and credit given by financial institutions that excludes borrowing by banking and other financial businesses.

Table 2 provides total borrowing of the nonfinancial business sector over 1997-2007. The total foreign and domestic debt fell almost 23 percent from 8,722,163 million baht in 1997 to 4,320,403 million baht in 2003 and increased back to 8,571,301 in 2007. The share of foreign borrowing fell from 24 percent in 1997 to 17 percent over 2003-2007, while that of domestic borrowing has increased from 76 to 83 percent over 1997-2007, particularly due to an increase in debt securities over 7 folds from 141,302 million baht in 1997 to 934,323 million baht in 2007. In summary, the average percentage of foreign debt is 21 percent and that of domestic debt is 79 percent.

[9] The external private debt is multiplied by the reference rate of US exchange rate reported the Bank of Thailand.

[10] Debt Securities include commercial papers such as debentures, promissory note and bill of exchange and bills

Table 2 Total Borrowing of Nonfinancial Business Sector

(Millions of baht)	**1997**	**1999**	**2001**	**2003**	**2005**	**2007**
Non-financial Foreign Borrowing	2,082,030	1,569,839	1,327,593	1,153,669	1,288,912	1,496,332
Non-financial Domestic Borrowing	6,640,133	5,324,761	4,320,403	5,442,963	6,239,654	7,074,969
Credit by Financial Institution1	6,498,831	5,138,885	4,068,682	4,985,204	5,662,760	6,140,646
Debt Securities	141,302	185,876	251,720	457,759	576,893	934,323
Total Credit	8,722,163	6,894,601	5,647,995	6,596,632	7,528,566	8,571,301
Percentage						
Non-financial Foreign Borrowing	24%	23%	24%	17%	17%	17%
Non-financial Domestic Borrowing	76%	77%	76%	83%	83%	83%
Total Credit	100%	100%	100%	100%	100%	100%

Source: Author Calculations and Bank of Thailand, www.bot.or.th

Total debt finance can be divided into debt finance of SET and that of non-SET firms shown in Table 3. Total debt finance for SET firms is calculated by the total equity[11] multiplied by the debt/equity (D/E) ratio – the ratio of debt to equity of nonfinancial SET firms. Although the D/E ratio declined dramatically as SET index increased more than three folds[12] over 2000-2007, the shares of SET and non-SET debts did not change greatly. Over 2000-2007, shares of debt finance of non-SET and SET firms were approximately 70 and 30 percent, respectively.

[11] Total Equity of SET firms is calculated from data given by SET Smart Enterprise. Details are explained in the next subsection.

[12] The SET index has increased more than three folds from 269.2 to 858.1 over 2000-2007.

Table 3 SET and Non-SET Debt Finance

Millions of Baht	**2000**	**2002**	**2003**	**2005**	**2007**
Total Debt	5,935,668	6,236,402	6,596,632	7,528,566	8,571,301
Total Non-Set Debt	4,196,521	4,236,871	4,657,809	5,070,853	5,834,929
Total SET Debt	1,739,148	1,999,531	1,938,823	2,457,713	2,736,371
Total Nonfinancial Equity	721,971	923,324	1,241,263	1,992,086	2,623,610
D/E	2.41	2.17	1.57	1.24	1.05
Proportion of Total Debt					
Total Non-Set Debt	0.71	0.68	0.71	0.70	0.70
Total SET Debt	0.29	0.32	0.29	0.30	0.30
Total Debt	1.00	1.00	1.00	1.00	1.00

Source: Author Calculations, Bank of Thailand, www.bot.or.th and the Securities Exchange of Thailand, www.set.or.th

3.2 Equity Finance

The total equity, including retained earnings and new share issues, of SET and non-SET firms are analyzed in this subsection. First, we find total equity for SET and non-SET firms, and then classified the total equity as undistributed profits and new issuance of stocks for SET firms. Domestic and foreign ownership of equity is also found for the study.

Table 4 Total Equity of SET and Non-Set Firms

Millions of Baht	**2000**	**2002**	**2003**	**2005**	**2007**
Total Equity	38,490,656	39,055,161	43,161,547	47,629,761	55,137,974
Equity of SET firms	721,971	923,324	1,241,263	1,992,086	2,623,610
Equity of Non-Set	37,768,685	38,131,837	41,920,285	45,637,675	52,514,364
Total Non-Set Debt	4,196,521	4,236,871	4,657,809	5,070,853	5,834,929
d= Debt/Asset	0.1	0.1	0.1	0.1	0.1
Proportion of Total Equtity					
Equity of SET firms	0.02	0.02	0.03	0.04	0.05
Equity of Non-Set	0.98	0.98	0.97	0.96	0.95
Total Equity	1.00	1.00	1.00	1.00	1.00

Source: Author Calculations, Bank of Thailand, www.bot.or.th and the Securities Exchange of Thailand, www.set.or.th

The total equity provided in Table 4 is for the nonfinancial business sector that excludes financial institutions such as bank, finance and insurance companies. Since we could not locate equity information for non-SET firms, we will use total liability and assume debt/asset ratio equal to 0.1[13] in order to find the total equity for non-SET firms. Given total liability (D) of non-set firms in Table 3 and debt/asset ratio (d), we could find total equity (E) by the formula (D-dD)/d. The total equity of all non-SET firms was around 52.5 trillion baht in 2007. Over 2000-2007, the share of non-SET equity was around 0.95 while that of SET equity was only about 0.05.

The proportions of retained earnings and new share issues of SET firms are given in Table 5. New share issues obtained are those of all nonfinancial SET stocks. Retained earnings or undistributed profits are the difference between total equity and new share issues. Over 2000-2007 for SET firms, the share undistributed profits was around 0.92 of total equity and that of new shares issue was around 0.07. Since we do not have data for non-SET firms, we assume that the proportions for non-SET firms are the same as SET firms.

Table 5 Retained Earnings and New Issues of Nonfinancial SET firms

Millions of Baht	**2000**	**2002**	**2003**	**2005**	**2007**
Equity	721,971	923,324	1,241,263	1,992,086	2,623,610
Retained Earnings	622,318	871,155	1,115,317	1,884,247	2,526,159
New Issues	99,653	52,168	125,946	107,839	97,451
Proportion of Equity					
Retained Earnings	0.86	0.94	0.90	0.92	0.91
New Issues	0.16	0.06	0.11	0.09	0.10

Source: Author Calculations, Bank of Thailand, www.bot.or.th and the Securities Exchange of Thailand, www.set.or.th

3.3 Source of Finance

The debt and equity finance of SET and non-SET firms can be classified by category of owners: local investors, tax-exempt institutions, and foreign investors. We will show how to find the following by type of owners: equity finance in SET firms, equity finance in non-SET firms, debt finance in SET firms, and debt finance in non-SET firms. The summary is in Table 6.

[13] In their calculations of the marginal effective tax rates for small and large firms in Thailand, Boadway, Flatters and Wen (1992) assume that debt/equity ratio is 0.45 for large firms and 0.10 for small firms. In our calculations, we assume that debt/asset ratio is 0.10, which is equivalent to debt/equity ratio of 0.11

Table 6 Source of Finance of SET and Non-SET Firms

	SET			non-SET		
	Debt	**Retained Earnings**	**New Share Issues**	**Debt**	**Retained Earnings**	**New Share Issues**
Local Investors	0.64	0.64	0.64	0.73	0.77	0.77
Institution	0.08	0.08	0.08	0.06	0.00	0.00
Foreign Investors	0.28	0.28	0.28	0.21	0.23	0.23
Total	1.00	1.00	1.00	1.00	1.00	1.00

Source: Author Calculations

First, equity finance by type of owners of the SET firms is found by assuming that ownership shares in SET firms reflect turnover values of SET classified by investor groups, average over 1997-2007. Annual turnover value of SET classified by investor groups over 1997-2007 is shown in Table 6. Thus, the average equity share of foreign investors is 28 percent; of institution investor is 8; and of local investors is 64 percent.[14]

Table 7 Turnover Value of SET Classified by Investor Groups over 1997-2007

	1997	**1999**	**2001**	**2003**	**2005**	**2007**
Buying and Selling Value*	1,859,195	3,219,574	3,155,516	9,340,563	8,134,362	8,543,639
Local Institutional Investors	184,778	157,703	124,537	575,417	840,100.4	1,216,854
Local Non-institutional Investors	870,251	2,114,987	2,443,361	7,099,129	5,044,376	4,560,914
Foreign Investors	804,167	946,884	587,619	1,666,016	2,249,886	2,765,871
Percentage of Buying and Selling Value (%)	100%	100%	100%	100%	100%	100%
Local Institutional Investors	10%	5%	4%	6%	10%	14%
Local Non-institutional Investors	47%	66%	77%	76%	62%	53%
Foreign Investors	43%	29%	19%	18%	28%	32%

Source: Securities and Exchange Commission, www.sec.or.th

*Buying and selling value = buying value + selling value

[14] Total debt financed by institutions includes the purchase of debt instruments by mutual funds, private provident funds, government provident funds, social security funds, and private funds

Second, shares of debt finance by type of owners in the SET firms is assumed to be the same as those of equity finance; that is, the share of local household is 0.64, that of institution is 0.08 and foreign investors is 0.28.

Total 8 Gross Domestic Private Investment and Net flows of Foreign Direct Investment over 1995-2002

	1997	**1999**	**2001**	**2003**	**2005**
Private Investment	1,048,482	535,537	784,680	1,036,600	1,544,200
Foreign Direct Investment	125,274	230,904	225,412	216,647	324,437
FDI/Private Investment	11.9%	43.1%	28.7%	20.9%	21.0%

Source: Bank of Thailand www.bot.or.th

Third, equity finance by type of owners of the non-SET firms is assumed as follows. Institution investors own minuscule amount of non-SET equity; thus the share is assumed to equal to zero. Foreign investors are assumed to hold non-SET equity share equal to the proportion of foreign direct investment to total non-bank private investment. On average over 1997-2007, the equity share of foreign investors is 0.23. Thus, equity share of local investor is 0.77

Fourth, debt finance by type of owners in the non-SET firms is similar to the structure of overall debts in Thailand. From Table 2, the foreign share of debt is 0.21 and the domestic share of debt is 0.79. Since institutions also make deposits in the financial institution that is channeled into loans for firms, we assume that institutions share about 8 percent of the deposits. Thus, the institution share is 0.06 and household share is 0.73.

3.4 Domestic versus Foreign Ownership

Domestic and foreign ownership of source of finance in 2007 is shown in Table 9. Of total financing of 63.7 trillion baht, approximately 77 percent was provided by domestic investors and 23 percent, by foreign investors. Domestic investors held 10 percent of debt issues, 64 percent of retained earnings, and 3 percent of new shares issues, whereas foreign investors held 3 percent, 19 percent, 1 percent, respectively. SET firms required about 8 percent of total financing and non-SET firms, about 92 percent. The proportions below would be used to find marginal effective tax rates of a combination of owners, firms and sources of finance in the next section.

Table 9 Domestic and Foreign Ownership of Source of Finance in 2007

	Millions of Baht				Percentages			
	Debt	**Re**	**NI**	**Total**	**Debt**	**Re**	**NI**	**Total**
1. Domestic Source	6,579,782	40,637,452	1,687,607	48,904,841	10%	64%	3%	77%
1.1 SET	1,970,187	1,818,835	70,164	3,859,187	3%	3%	0%	6%
Household	1,751,278	1,616,742	62,368	3,430,388	3%	3%	0%	5%
Institution	218,910	202,093	7,796	428,799	0%	0%	0%	1%
1.2 Non-Set	4,609,594	38,818,618	1,617,442	45,045,654	7%	61%	3%	71%
Household	4,259,498	38,818,618	1,617,442	44,695,558	7%	61%	3%	70%
Institution	350,096	0	0	350,096	1%	0%	0%	1%
2. Foreign Source	1,991,519	12,302,496	510,418	14,804,434	3%	19%	1%	23%
2.1 SET-foreign	766,184	707,325	27,286	1,500,795	1%	1%	0%	2%
2.2 Non-SET-foreign	1,225,335	11,595,172	483,132	13,303,639	2%	18%	1%	21%
3. Total Financing	8,571,301	52,939,949	2,198,025	63,709,275	13%	83%	3%	100%

Source: Author Calculations

4. Estimates of Marginal Effective Tax Rates

In estimating METRs below, we make three important assumptions. First, all firms are subject to the standard rate of 30 percent (u = 0.30). Second, all domestic savers are taxpayers that pays the top marginal personal income tax rate (m_i = 37). Third, we assume that new share issues generate a stream of profits result in the return to stockholders in form of share value appreciation.

The overall METR for domestic investors is 38.4 percent, while the overall METR for foreign investors is 31.6 percent. The latter includes only the impact of host country tax system on METR.[15] The overall METR is a weighted average of METRs of a hypothetical project, where each project corresponds to a particular combination of source of finance, owners and firms. METRs of a hypothetical project, overall METRs by type of finance and overall METRs by source of firm are discussed in turn.

4.1 METRs of a Hypothetical Project

Although a strict assumption is imposed on depreciation that statutory and economic depreciation rates are equal, it does provide neat results in understanding the marginal effective tax rate of a combination of source of finance, owners, and firms.

[15] Leechor and Mintz (1991) and Aemkulwat (1999) study the impact of host and home country tax systems on the marginal effective tax rates.

The METRs of domestic and foreign investors are given for different sources of finance, as shown in Table 10 and Table 11.

Table 10 Marginal Effective Tax Rates of Domestic Investors

	Debt	**Retained Earnings**	**New Issues**	**Average METR**
Local investors				
SET	15.0%	30.0%	37.0%	22.5%
Non-SET	15.0%	43.0%	37.0%	40.1%
Institution				
SET	10.0%	30.0%	37.0%	19.9%
Non-SET	10.0%	30.0%	37.0%	10.0%
Average METR	14.6%	42.4%	37.0%	38.4%

Source: Author Calculations

Table 11 Marginal Effective Tax Rates of Foreign Investors

	Debt	**Retained Earnings**	**New Issues**	**Average METR**
SET	15.0%	30.0%	37.0%	22.5%
Non-SET	15.0%	33.5%	55.9%	32.6%
Average METR	15.0%	33.3%	54.9%	31.6%

Source: Author Calculations

Debt Finance

Given a category of owner, there is no discrimination against purchasing debt instruments by domestic and foreign savers from firms listed or not listed in the SET. For domestic savers, owning debt instruments via tax-exempt institutions results in lowering the marginal effective rate by 5 percentage points. For top-bracket local investors, METR is equal to 15 percent ($w^I = .15$) and for tax-exempt institutions, METR is equal to 10 percent ($w^U = .10$). Since the tax on interest from corporate debentures or bank deposits are withheld 15 percent at source, the top-bracket local investors shown in Table 10 bear the marginal effective tax rate of 15 percent as they will opt for excluding interest income from the taxable income. Moreover, local investors who buy investment units from mutual funds that hold only debt instruments in their portfolios bear the lower tax. Even though institutions are exempt from tax on all income, individual taxpayers have to bear 10 percent withholding tax at source, as they would choose not to include shares of profits in the taxable income.

For foreign investors, METR is equal to 15 percent (w^{FI} = .15); thus, the marginal effective host country tax rate is equal to the withholding tax on interest income for nonresidents. Foreign investors bear the same METR equal to that of domestic local investors.

Retained Earnings

Suppose that stockholders in companies that retain earnings get the return from capital gains in the sale of equity shares. At the personal income tax level, the tax treatment of capital gains for SET firms is much more generous than that for non-SET firms.

Since capital gains from the sale of equity shares in the Security Exchange of Thailand are free from tax, the marginal effective tax rates of local investors, institution, and foreign investors are the same at 30 percent. This is equal to the corporate tax rate of 30 percent (METR = u = .30).

For non-SET firms, the marginal effective tax rate for institutions is lowest. For institutions, METR = u = .30. Using the view that only households are an ultimate owner who bears the tax, the marginal effective tax rate for institutions is 30 percent since all capital gains from rising value of investment unit of general funds are exempt from taxation. In contrast, for local investors, METR = $u+m_g(1-u)$. Savers whose income is derived from capital gains of non-SET stocks bear the marginal tax rate of 43 percent. The METR includes the corporation income tax rate of 30 percent (u) and the capital gains tax rate of 13 percent [m_g*(1-u)]. Note that the effective accrued capital gains tax is 18.5 percent.

Foreign savers investing in SET firms, METR = u, and those investing in non-SET firms, METR = $u+m_g(1-u)$. The effective accrued capital gains tax for nonresidents holding non-SET shares is lower than that for residents since foreign savers are liable only for withholding tax rate of 10 percent on realized capital gains; thus, the effective accrued capital gains tax mg is 5 percent. Foreign investors bear the host country tax of 33.5 percent which includes the corporation income tax rate of 30 percent (u) and the withholding tax rate of 3.5 percent [$m_g(1-u)$].

New Share Issues

Assume that new share issues only give rise to a stream of dividends. The tax treatment on dividends is the same for SET and non-SET firms.

For local investors, METR = m_i = .37; for institution, METR = $u + w^U(1-u)$ = .37 where w^U is the withholding tax rate of 10 percent. For local investors and

institutions, the marginal effective tax rates are equal at 37 percent even though the tax treatment is different. Gross dividend income received by local investors is taxed at the graduated tax rate after given a credit for the corporation tax paid. The assessable income of one baht of dividend is equal to the gross dividend – 1/(1-u) – or the profit before the corporation tax. The marginal effective tax rate is equal to 37 percent which is the top marginal income tax rate because of the integration of corporation and personal income tax. The government achieves this by taxing at the corporate level at rate u, crediting at the personal level at rate u and taxing at the personal level at rate m_i.

Local investors receiving dividend income from tax-exempt institutions are not allowed tax credit on dividend received. Since local investors will opt for paying only the withholding tax rate of 10 percent ($w^U = .10$), METR = $u + w^U(1-u) = .37$; the marginal effective tax rate equal to the corporation tax rate u plus the withholding tax rate $w^U(1-u)$. The marginal effective tax rate is 37 percent.

For foreign investors, METR = $u + m_i(1-u) = 0.56$. The marginal effective tax rate on capital gains is relatively high of 56 percent. The reason is that dividend income of nonresidents is required to be included in the taxable income. Since we assume that investors are in the top income bracket, the METR on capital gains for foreign investors is equal to the corporation income tax u of 30 percent plus the personal income tax, $m_i(1-u)$ of 25.9 percent.

4.2 Overall METRs by Source of Finance

The METR for domestic investors by source of finance in Thailand is also given in Table 10. The METR is highest at 42.4 percent for retained earnings, next is 37 percent for new share issues, and lowest is 14.6 percent for debt. The reason that retained earnings bear a higher METR because a large proportion of total equity is hold by local investors in non-SET firms whose capital gains are taxed as ordinary income; the METR is 43 percent. Table 12 shows the weights of local investors and institutions by type of finance. Retained earnings, the most important source of funds for non-SET firms, comprise 96 percent of all undistributed profits. The METR for debt of 14.6 percent is slightly lower than a 15% withholding rate at source since interest income from institutions bear a 10% withholding rate at source but they hold only about 8 percent of all debt issues. Finally, dividend income is taxed at the same rate at 37 percent.

Table 12 Weights by Domestic Source of Finance

Weights by Source	Debt	Retained Earnings	New Issues	Weighted Average
Local investors	0.91	1.00	1.00	0.98
Set	0.27	0.04	0.04	0.07
Non-Set	0.65	0.96	0.96	0.91
Institution	0.09	0.00	0.00	0.02
Set	0.03	0.00	0.00	0.01
Non-Set	0.05	0.00	0.00	0.01
Total	1.00	1.00	1.00	1.00

Source: Author Calculations

In Table 11, for foreign investors, the METR by source of finance can be ranked from highest to lowest: 54.9 percent for new share issues, 33.3 percent for retained earnings, and 15 percent for debt finance. The overall METR of 33.3 percent for retained earnings is very close to 33.5 percent for non-SET firms since the total equity of non-SET firms is much larger compared to SET firms.

4.3 Overall METRs by Type of firms

For domestic investors, the marginal effective tax rate for SET firms is lower than that for non-SET firms. The METR differential is around 18 percentage points. Specifically, the METR for non-SET firms is 39.8 percent and METR for SET firm is 22.0 percent. There are three reasons for this large differential: first, local investors owning non-SET shares have to pay capital gains tax on companies' share value appreciation while those owning SET shares do not. Second, non-SET firms depend 86 percent on retained earning as the source of finance as shown in Table 13. Third, SET firms depends more on debt, the cheaper source of finance, than non-SET firms. The proportion of debt for SET firms is 0.51 while that for non-SET firms is 0.10.

Table 13 METRs and weights of SET and non-SET firms for Domestic Investors

METR	Debt	Retained Earnings	New Issues	Weighted Average
SET	14.4%	30.0%	37.0%	22.2%
Non-SET	14.6%	43.0%	37.0%	39.8%
Average METR	14.6%	42.4%	37.0%	38.4%
Weights				
SET	0.51	0.47	0.02	1.00
Non-SET	0.10	0.86	0.04	1.00

Source: Author Calculations

For foreign investors, the METR differential between SET and non-SET firms is about 10 percentage points. Specifically, the METR for SET firms is 22.5 percent and that for non-SET firms is 32.6 percent. A relatively large differential is due to a strong dependence of undistributed profits of non-SET firms and a higher reliance of debt finance by SET firms as shown in Table 13.

Table 13 METR and Weights of SET and Non-SET Firms for Foreign Investors

METR	Debt	Retained Earnings	New Issues	Weighted Average
SET	15.0%	30.0%	37.0%	22.5%
Non-SET	15.0%	33.5%	55.9%	32.6%
Average METR	15.0%	33.3%	54.9%	31.6%
Weights				
SET	0.51	0.47	0.02	1.00
Non-SET	0.09	0.87	0.04	1.00

Source: Author Calculations

5. Conclusion

The marginal effective tax rates for domestic savers that include local investors and tax-exempt institutions are analyzed in the case of Thailand. As a by-product, the marginal host country effective tax rates of foreign investors are also obtained in the case of Thailand which has no double tax treaties with other countries. The overall marginal effective tax rate for domestic savers is approximately 38.4 percent. In addition, the marginal effective tax rate for domestic savers in companies listed in the Security Stock of Exchange is 22.5 percent and that in unlisted firms is around 40 percent. The differential is due to a heavier use of owner equity whose owners in the non-SET firms have to bear capital gains tax and a less reliance of debt finance whose ultimate owners of non-SET firms could bear a smaller effective tax. For foreign investors, the overall marginal effective tax rate paid to Thailand is about 31.6 percent.

The METR calculations above may be overestimated due to at least four reasons. First, the corporation income tax is more generous after the economic crisis of 1997. In the calculations, we assume that the corporate tax rate is 30 percent and the statutory depreciation deductions are equal to economic depreciation. Thus, METRs above does not account the tax benefits from specific rate reductions and accelerated depreciation.

Second, the overall METR for foreign investor is calculated under the case where Thailand has no double tax treaties with foreign countries. If the exemption or

reductions of withholding tax rates are accounted from double tax treaties, the marginal effective host country tax rate should be much lower than 31.6 percent. In addition, TDRI (2001) reports that in practice nonresidents do not include dividend income in the computation of the personal income tax in Thailand.

Third, the METRs for tax-exempt institutions do not account for the fact that the returns from these funds may not be liable for tax at all at the personal level. In computing the shares of debt and equity financed, tax-exempt institutions are those that include mutual funds, private provident funds, government provident funds, social security funds, and private funds. Private and government provident funds are retirement funds. Individuals are allowed to deduct contributions to these funds from the taxable income in their working years and receive retirement benefits in their retirement years. Since the marginal personal income tax rate is likely to be high during working years and to be low or even be zero during retirement years, the marginal effective tax rate could be negative. This should result in lower METRs for tax-exempt institutions.

Finally, although we could obtain very neat estimates of METRs of each of a hypothetical project, this comes at the price of assuming zero inflation. Since borrowers benefit and lenders lose in the presence of inflation, the METRs under debt finance could even be lower than those in the calculations.

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